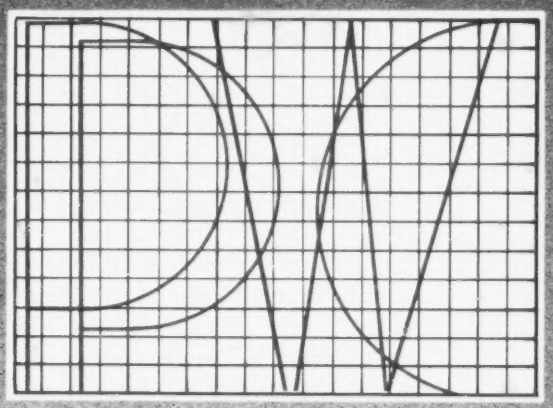
A2500-6



PAPER PAPERBOARD WOODPULP CAPACITY

FIBER CONSUMPTION
1979-1982 with additional data for 1983

DEFINITIONS AND GRADE DESCRIPTIONS

Practical Maximum Capacity: Practical Maximum Capacity, as defined in this survey, is the tonnage of paper, paperboard or pulp of normal commerical quality that could be produced with full use of equipment and adequate supplies of raw materials and labor, and assuming full demand. No allowance is made for losses due to unscheduled shutdowns, strikes, temporary lack of power, etc, which cause decreases in actual production, but not in productive capacity. Capacity of paper machines which produce more than one grade is apportioned in accordance with actual production patterns or plans for future operation.

Capacity is reported in short tons of net finished paper and paperboard and air-dry (10% moisture content) pulp. Shrinkage of bleached or semibleached pulp is taken into account.

Annual practical maximum capacity— includes changes in capacity only for the portion of the year in which they are actually effective.

Year-end practical maximum capacity — assumes that all changes in capacity are in effect from the first day of the year in which they occur.

New Machines and Net Improvements: Capacity increases or decreases are shown in two main groups: New Machines and Net Improvements.

New Machines — are defined as machines purchased or to be purchased from equipment manufacturers. Consequently, capacity changes resulting from transfer of paper machines from one mill to another are shown under Net improvements.

Net Improvements — are defined as net changes resulting from modernization of machines, dismantling old machines, shifts in grades, etc.

Capacity increases from new machines are shown under New Machines for the first two years of operation (including the year of installation). Any additional capacity realized in a third or subsequent year is shown under Net Improvements.

Market Pulp Capacity: Market pulp in this survey is defined as woodpulp produced in the U.S. for sale to pulp consumers. It excludes pulp for use or consumption by a producing mill or for shipment by a producing mill to other mills within its supply region which it owns, controls or with which it is affiliated. (Shipments to owned mills outside the U.S. are defined as market pulp.)

PAPER GRADES

Newsprint: Paper used chiefly in the printing of newspapers, made largely from mechanical pulp and weighing not less than 28½ pounds nor more than 35 pounds (24 x 36 - 500).

Uncoated Groundwood: Uncoated papers containing more than 10% groundwood fiber in their furnish, excluding newsprint.

Machine and Off Machine Coated: Bleached papers with a coating weight of at least 2½ pounds (25 x 38 - 500) on either side and at least 50% of the coating consisting of clay (Kaolin).

Coated Groundwood: Coated papers containing more than 10% mechanical pulp (mostly stone groundwood and/or refiner) in their furnish.

Coated Free Sheet: Coated papers containing 10% or less mechanical pulp (mostly stone groundwood and/or refiner in their furnish).

Uncoated Free Sheet: Bleached uncoated printing and writing papers containing not more than 10% groundwood pulp in their furnish; i.e., offset, tablet, envelope, business papers (bond, ledger, mimeo, duplicator) form bond, cover and text and related papers.

Bleached Bristols: Includes tabulating index, tag and file folder, coated cover bristols, and uncoated bristols (index, printing, and postcard).

Cotton Fiber: Papers containing 25% or more in their furnish of cotton, cotton rags, cotton waste, linters, linter pulp, flax, or similar fibers.

Thin Papers: Includes carbonizing, condenser, cigarette, bible, and similar papers.

Packaging and Industrial Converting: Wrapping paper, shipping sack, bag and sack other than shipping sack, and other converting papers — 18 pounds and over.

Unbleached Kraft: Paper containing more than 80% unbleached sulphate woodpulp. Wrapping paper, shipping sack, grocers sack and other bag, and other converting papers — 18 lbs. and over (24 x 36 - 500).

Bleached Packaging and Industrial Converting: Paper made for similar end uses as unbleached kraft, but made from bleached, and semi-bleached sulphate and unbleached sulphite pulps. Wrapping paper, shipping sack, grocers and other bag and sack, and other converting papers — 18 lbs. and over (24 x 36 - 500).

Specialty Packaging* Paper and board of all weights and furnishes, usually used as protective packaging for food and other consumer products, such as bakery bags, fast food and frozen food wraps. Also includes glassine, greaseproof and vegetable parchment paper.

Special Industrial: Paper and board, of all weights, calipers and furnishes, designed for specialized end uses and manufactured to exact customer specifications; includes abrasive paper, electrical insulation, filter paper and similar grades. Does not include wet machine board.

Tissue: Includes sanitary grades; i.e., toilet, facial, napkin, toweling, sanitary napkin, wiper and special sanitary papers, and waxing, wrapping, wadding and miscellaneous grades.

PAPERBOARD GRADES

Unbleached Kraft Paperboard: Paperboard made from a furnish containing not less than 80% woodpulp produced by the kraft sulphate process.

Linerboard: Unbleached kraft paperboard manufactured for use as facing material when combining paperboard for conversion into corrugated or solid fiber boxes. Includes solid unbleached kraft linerboard, both Fourdrinier and Cylinder, mottled white linerboard and clay coated unbleached kraft linerboard.

Folding: Paperboard manufactured, such as clay coated unbleached kraft and bleached lined unbleached kraft backed, for conversion into folding cartons and beverage carriers.

Other: All unbleached kraft paperboard whose end use is not otherwise classified, such as board for a filler for solid fiber boad to be fabricated into a shipping container, tube, can, drum, file folder, tag, automotive panel, etc.

Solid Bleached Packaging Paperboard: Paperboard made for use in packaging from a furnish containing not less than 80% virgin bleached woodpulp. Bleached bristols not manufactured for packaging are included in the proper bleached bristol classification under papers.

Linerboard: Solid bleached paperboard, either Fourdrinier or Cylinder, manufactured for use as facing material when combining paperboard for conversion into corrugated or solid fiber boxes.

Folding: Solid bleached paperboard for conversion into folding cartons, such as folding cartons for ice cream, butter, oleomargarine, frozen foods, bakery products, cosmetics, drugs, etc.

Milk Carton and Food Service: Solid bleached paperboard for conversion into milk carton, heavyweight cup, and round nested food container, plate, dish and tray, and for packaging for moist, liquid and oily foods.

Other: Solid bleached paperboard for conversion into packaging of blister pack, tubes and other products not classified above and for industrial products not classified under bleached bristols.

Semichemical Paperboard: Paperboard made from a furnish containing not less than 75% virgin woodpulp, the predominant portion of which is produced by a semichemical process.

**Included with bleached packaging papers in this survey.*

(Continued on back inside cover.)

CONTENTS

COMMENTARY 3 - 7

SUMMARY
ANNUAL CAPACITIES 8 - 11
Paper, Paperboard 8
Construction Paper and Board 8
Woodpulp 10
Market Woodpulp 11

MILLS AND MACHINES SHUT DOWN 9

CAPACITY BY GRADE
ANNUAL AND YEAR END 12 - 17
Paper 12 - 13
Construction Paper and Board 13
Paperboard 14 - 15
Woodpulp 16 - 17

REGIONAL CAPACITIES 18 - 19

FIBER FOR PAPER AND PAPERBOARD MANUFACTURE 20 - 21
Woodpulp - Own Manufacture and Purchased
Waste Paper
Other Fibers

PULPWOOD FOR WOODPULP MANUFACTURE 21
Roundwood
Manufacturing Residues
Forest Residues

WASTE PAPER CONSUMPTION END USE 22 - 23

WORLD CAPACITIES 22 - 23
Woodpulp 22
Paper and Paperboard 23

ANNOUNCED CAPACITY EXPANSIONS 24

DEFINITIONS AND GRADE DESCRIPTIONS Inside covers

AMERICAN

PAPER INSTITUTE

OFFICERS

Chairman
JOHN B. FERY
Chairman & Chief Executive Officer
Boise Cascade Corp.

Vice Chairman
BRENTON S. HALSEY
Chairman & Chief Executive Officer
James River Corp.

President
LOUIS F. LAUN

Senior Vice President
NORMA PACE

Vice President, Government Affairs
FREDERICK S. BENSON, III

Vice President, Fourdrinier Kraft Board
WILLIAM V. DRISCOLL

Vice President, Paperboard
J. RODNEY EDWARDS

Vice President, Paper
JAMES L. HUTCHISON

Vice President, International
IRENE W. MEISTER

Vice President, Transportation
ROY E. OLSON

Vice President, Pulp, Fiber & Raw Materials
RONALD J. SLINN

Vice President, Administration
GERALD H. SLOTNICK

COUNSEL
Chadbourne, Parke, Whiteside & Wolff

OFFICES

NEW YORK Headquarters

260 Madison Avenue
New York, New York 10016
Telephone: (212) 340-0600

WASHINGTON, D.C.

1619 Massachusetts Avenue, N.W.
Washington, D.C. 20036
Telephone: (202) 332-1050

SURVEY COMMENTARY

Additions to paper and paperboard capacity are estimated at 5,159,000 tons during the next three years, according to the latest survey of the American Paper Institute. These increases will carry the capacity of the U.S. paper and paperboard industry to 75,937,000 tons in 1983. An increase of 4,136,000 tons of woodpulp capacity is expected for 1981 through 1983 bringing the total to 59,064,000 tons. In percentage terms, capacity growth for paper, paperboard and woodpulp will average 2.4% a year and will be somewhat higher than the 2.1% annual average growth rate during the 1970 decade. Compared with last year's survey, these figures show slightly lower levels of overall capacity in 1980 because of a change in the use of operating days to calculate annual capacity and the continued impact of shutdowns. Individual grade capacities also show the effect of changes in the expected allocation of machine capacity among grades.

TABLE 1:

GROWTH TRENDS IN CAPACITY

Thousands short tons

GRADES	ADDITIONS 1961-1970		ADDITIONS 1971-1980		ADDITIONS 1981-1983	
	10 YEAR INCREASE	AVERAGE ANNUAL GROWTH	10 YEAR INCREASE	AVERAGE ANNUAL GROWTH	3 YEAR INCREASE	AVERAGE ANNUAL GROWTH
PAPER AND PAPERBOARD TOTAL ALL GRADES	**16,878**	**3.6%**	**13,501**	**2.1%**	**5,159**	**2.4%**
TOTAL PAPER	**8,394**	**4.0**	**6,739**	**2.3**	**3,163**	**3.1**
NEWSPRINT	1,157	4.2	1,290	3.2	930	6.1
PRINTING & WRITING	4,906	5.3	4,473	3.2	1,693	3.3
PACKAGING & IND. CONV.	624	1.1	201	0.3	236	1.3
TISSUE	1,707	5.4	776	1.7	303	2.0
TOTAL PAPERBOARD	**8,189**	**3.6**	**6,198**	**2.0**	**2,042**	**2.0**
UNBLEACHED KRAFT	5,727	6.5	3,654	2.6	1,236	2.5
SOLID BLEACHED	1,492	5.8	793	2.1	14	0.1
SEMICHEMICAL	1,395	4.8	1,191	2.8	653	4.2
RECYCLED	(425)	(0.5)	560	0.7	139	0.5
CONSTRUCTION GRADES	**295**	**0.8**	**564**	**1.4**	**(46)**	**(0.3)**
WOODPULP						
TOTAL ALL GRADES	**15,654**	**4.4%**	**10,216**	**2.1%**	**4,136**	**2.4%**
DISSOLVING & SPECIAL ALPHA	406	2.6	(189)	(1.1)	–	–
SULPHITE	(507)	(1.9)	(457)	(2.1)	2	–
SULPHATE & SODA*	13,765	6.0	8,591	2.5	2,514	2.1
SEMICHEMICAL	1,306	4.5	872	2.1	565	4.0
MECHANICAL	684	1.3	1,398	2.2	1,056	4.8

* *Includes screenings*

Note: Not adjusted for rounding differences

Capital expenditures for both primary and converting facilities are expected to total six billion dollars in 1980, almost double the outlays for 1976. These increases reflect the effect of inflation, high regulatory costs, large investments in energy conservation and continued modernization programs. Financing the expected expansions for the 1981-1983 period will require an ever larger infusion of dollars into the capital stock of the industry.

TABLE 2:

NEW PAPER AND PAPERBOARD MACHINES 1981-1983

GRADES	NUMBER OF MACHINES
PAPER	
NEWSPRINT	2
PRINTING & WRITING	7
UNBLEACHED KRAFT PAPER	1
TISSUE	3
PAPERBOARD	
UNBLEACHED KRAFT LINERBOARD	3
SEMICHEMICAL	2
TOTAL	**18**

The capacity estimates are not forecasts made by the American Paper Institute, they are the sum of expansion plans for some 300 companies with more than 700 paper, paperboard and woodpulp mills and were reported to the Institute in its annual industry-wide survey.

Producers of paper and paperboard report plans to install 18 new paper and paperboard machines in the years 1981-1983 which, together with continued gains from machines that came on stream in 1980, will add 3,942,000 tons of new capacity. Additional capacity from machine rebuilds and other improvements, netted against losses from shut down or dismantled facilities, will total 1,217,000 tons. While new machines will account for an unusually high 76% of the total gain in paper and paperboard capacity, most of the machines will be installed in existing mills and only two "greenfield" mills are reported in the three year expansion.

Consistent with the trends reported in last year's survey, particularly strong growth is expected in newsprint and coated groundwood capacity – grades that have enjoyed favorable U.S. markets in the last few years.

Growth in semichemical paperboard and semichemical woodpulp capacity will also be strong, while capacity for thermomechanical pulp, which has gained wide acceptance in the newsprint industry, will increase by 819,000 tons, or 61%, for 1981 through 1983.

Survey Methods Improved

Under the guidance of an industry advisory committee, and aided by a new computer program capable of processing the increased number of calculations, the survey methodology has been expanded this year to provide a more precise measurement of capacity based upon actual operating days for specific machines. Previous surveys assumed that the maximum number of days a mill operated applied to each and every machine in the mill. This was not a realistic assumption.

This year's survey uses the operating day schedules of individual machines reported by member companies to calculate the annual capacity for each machine. The variations in individual machine operating days are not sporadic but are based upon processing characteristics which determine the operating schedules. Future changes in individual machine operating schedules are also included in the survey. The net effect of the changes is to lower paper and paper board capacities from the levels calculated on the previous basis. Capacity would have been overstated by amounts ranging from 310,000 tons in 1979 to 437,000 tons in 1983 on the basis of the earlier procedure.

TABLE 3:

DIFFERENCES IN ANNUAL CAPACITY BASED ON MACHINE DAYS VS MILL DAYS

Thousands short tons

PAPER AND PAPERBOARD	1979	1983
TOTAL ALL GRADES	**(310)**	**(437)**
TOTAL PAPER	**(203)**	**(272)**
NEWSPRINT	2	(18)
PRINTING & WRITING	(76)	(93)
PACKAGING & IND. CONV.	(104)	(123)
TISSUE	(25)	(38)
TOTAL PAPERBOARD	**(104)**	**(180)**
UNBLEACHED KRAFT	(39)	(65)
SOLID BLEACHED	(7)	(14)
SEMICHEMICAL	(12)	(23)
RECYCLED	(46)	(78)
TOTAL CONSTRUCTION GRADES	**(3)**	**15**

Mill and Machine Closures

More than 1.5 million tons of paper and paper board capacity were removed from the estimated overall capacity in 1979 and 1980 because of shutdowns. One million tons were subtracted from the estimates in last year's survey and an additional 632,000 tons from this year's estimates. This tonnage represents the capacity of 54 machines, including 23 mills, that have been shut down for periods described by company managements as permanent or indefinite. For the most part, the closures have involved marginal facilities that cannot be operated economically, some facing large capital outlays to meet government air or water standards that cannot be cost justified.

Regional Capacity

Continuing the trend of recent years, most of the growth in unbleached kraft paperboard and woodpulp capacity will occur in the South Atlantic and in the East and West South Central regions of the U.S. Collectively, these regions will provide 89.5% of all new containerboard capacity and 73.8% of all new woodpulp capacity and, in 1983, they will account for 65.0% and 66.6% of all paperboard and woodpulp capacity respectively.

New England and East North Central states will provide a significant portion of new printing and writing paper capacity and the Mountain and Pacific regions will account for 685,000 tons, or about one-half, of the expected increase in newsprint capacity.

Raw Material Consumption

Table 5 shows the pattern of fibrous raw materials used in the manufacture of paper and paperboard. Data represent actual consumption for 1979, producers' estimates of consumption for 1980, and the consumption equivalent of capacity operations for 1981 through 1983. In 1979, the industry consumed 15,520,000 tons of waste paper which represented 23.3% of all fibers consumed. By 1983, consumption is expected to reach 17,514,000 tons if the industry operates at capacity in that year. The industry also consumes agricultural, textile and other industrial waste fibers.

Woodpulp consumption in 1979 totalled 50,435,000 tons of which an estimated 21,687,000 tons were derived from byproducts of logging and manufacturing.

TABLE 4:

ANNUAL CAPACITY INCREASES 1980-1983*

Thousands short tons

REGION	PAPER			PAPERBOARD		WOODPULP		
	NEWS-PRINT	PRINTING & WRITING	TISSUE	UN-BLEACHED KRAFT	SEMI-CHEMICAL	SULPHATE & SODA	SEMI-CHEMICAL	ME-CHANICAL
NEW ENGLAND	(23)	538	28	–	–	87	(5)	153
MID ATLANTIC	14	139	32	–	–	14	17	(19)
E. NO. CENTRAL	13	586	53	–	287	38	111	126
W. NO. CENTRAL	–	165	–	–	(71)	15	(71)	58
SO. ATLANTIC	267	88	105	475	(17)	974	12	275
E. SO. CENTRAL	146	405	9	527	220	792	133	204
W. SO. CENTRAL	378	143	118	608	323	970	363	298
MOUNTAIN AND PACIFIC	685	266	51	41	(7)	439	8	454

* *4 year period*

TABLE 5:

FIBER SOURCES FOR PAPER AND PAPERBOARD MANUFACTURE

Thousand short tons

GRADES	1979 ANNUAL TONS	1979 PERCENT	1980 ANNUAL TONS	1981 ANNUAL TONS	1982 ANNUAL TONS	1983 ANNUAL TONS	1983 PERCENT
TOTAL CONSUMPTION	**66,699**	**100.0**	**68,579**	**72,252**	**74,652**	**75,604**	**100.0**
WOODPULP FROM PRIMARY FIBERS	28,748	43.1	30,615	31,565	32,249	32,667	43.2
TOTAL SECONDARY FIBERS	37,951	56.9	37,964	40,687	42,403	42,937	56.8
WOODPULP FROM RESIDUES	21,687	32.5	21,628	23,331	24,428	24,645	32.6
WASTE PAPER*	15,520	23.3	15,606	16,586	17,201	17,514	23.2
OTHER VEGETABLE FIBERS	744	1.1	730	770	774	778	1.0

* *Includes 159,000 tons in 1979 and 172,000 tons in 1980-1983 for molded pulp products*

PAPER GRADES

Newsprint

While five new newsprint machines with capacities totalling almost 900,000 tons came on stream in 1979 and 1980, only two new machines are scheduled for start-up in 1981, and no machines have been announced for 1982 or 1983. Due to the continuing capacity gains from recently installed new machines and to the conversion to newsprint production of two machines that had been producing other grades, capacity growth will remain strong through 1983, with a total gain of 930,000 tons. This expansion will bring U.S. annual capacity to 5,680,000 tons in that year.

Printing and Writing Papers

A gain of 8.2% in the 1980 capacity for coated groundwood papers will be followed by a continued strong increase of 893,000 tons, or a 9.8% average annual gain, over the next three years. There are also expansions in the uncoated groundwood grade of 191,000 tons in 1982 and 1983. Together, the capacity of these two groundwood grades, which comprised only 25% of total printing and writing grades in 1979, will furnish 64.2% of all capacity growth in the 1981-1983 period.

Unbleached Kraft Packaging Papers

The allocations of more kraft machine time to the production of kraft linerboard from kraft specialty papers resulted in a reduction of some 120,000 tons in the capacity reported for 1980. Despite the start-up of a new 155,000 ton kraft paper machine in 1982, the shutdown of an existing machine and other factors will hold total growth in capacity to a modest 188,000 tons for the entire three year period. This is based upon current estimates of future machine allocations. It is important to remember the relative ease with which swing machines can be diverted from the production of linerboard to paper in assessing future supply.

It had been our intention this year to report capacity for specialty packaging papers as a separate grade category. However, data did not reach publication standards and, as in previous reports, capacity for these papers is included with bleached packaging and industrial converting papers. We do expect to break out the capacity for this grade in our next report.

TABLE 6:

ANNUAL CAPACITY ALL GRADES PAPER AND PAPERBOARD

Thousands short tons

YEAR	ANNUAL CAPACITY	ADDITIONS DURING YEAR	PERCENT INCREASE
1960	39,845	1,303	3.4
1961	41,122	1,277	3.2
1962	42,127	1,005	2.4
1963	43,013	886	2.1
1964	44,419	1,406	3.3
1965	46,071	1,652	3.7
1966	48,574	2,503	5.4
1967	51,464	2,890	5.9
1968	53,814	2,350	4.6
1969	55,974	2,160	4.0
1970	57,195	1,221	2.2
1971	58,141	946	1.7
1972	59,965	1,824	3.1
1973	62,284	2,319	3.9
1974	63,779	1,495	2.4
1975	64,369	590	0.9
1976	65,673	1,304	2.0
1977	66,459	786	1.2
1978	67,419	960	1.4
1979	69,033	1,614	2.4
1980F	70,778	1,745	2.5
1981F	72,538	1,760	2.5
1982F	74,777	2,239	3.1
1983F	75,937	1,160	1.6

F - Forecast

Tissue

The net growth in tissue capacity will average 2.0% per year through 1983, to bring the industry total to 5,264,000 tons. In our survey last year, capacity for tissue was expected to reach 5,395,000 tons as early as 1982. The reduced rate of growth is due to the removal of 129,000 tons of capacity for 7 tissue machines shut down in 1979 and 1980 and to the indefinite postponement of a new tissue machine that had been announced for start-up in 1982.

PAPERBOARD GRADES

Containerboard

Capacity for semichemical corrugating medium, the core material in containerboard, is expected to grow at an average annual rate of 4.2% during the next three years. Growth in the capacity for unbleached kraft linerboard will average only 2.5% annually during the same years. An analysis of these grades, shows that these apparently disparate rates of growth will correct rather than create a slight imbalance that was implied by previous capacity figures. The traditional relationship between these grades will be restored in 1983 as a result of these capacity changes.

Solid Bleached Paperboard

Capacity for solid bleached paperboard will remain flat cover the next three years. At 4,260,000 tons in 1982, the capacity will be 234,000 tons below the estimate reported for that year in our last survey. Almost all of this decline results from the reallocation of capacity from bleached paperboard to bleached kraft market pulp.

Recycled Paperboard

The shutdown and replacement of uneconomic facilities has been a considerable problem in the recycled paperboard segment of the industry. From 1970 through 1978, 28 mills, comprising 67 paperboard machines and with capacities totalling 1,942,000 tons, were reported to the API as permanent closures. An additional eight machines with a total capacity of 273,000 tons have been shut down and removed from this year's capacity estimates for 1979 and 1980. These losses have effectively offset several expansion projects reported in this survey and the capacity for recycled grades is now expected to remain at about 5.8 million tons through 1983.

WOODPULP

Dissolving and Special Alpha Pulps

Negligible growth in capacity is reported for dissolving pulp and current estimates of 1.6 million tons are almost identical to those reported in last year's survey. Capacity for these grades has shown only minor changes in the last 15 years and have reflected swings between dissolving and paper grade pulps rather than the installation of new facilities.

Chemical Paper Grade Pulps

With planned additions totalling 2,502,000 tons, capacity for sulphate and soda pulps will reach 42,223,000 tons in 1983 and will comprise 71.5% of total U.S. woodpulp. New pulp installations, mostly in existing mills, will provide 1,669,000 tons or about two-thirds of this 1981-1983 increase.

Capacity for sulphite pulps, after a prolonged decline, now totals only 2.0 million tons or less than 5.0% of the chemical paper grades total in 1979. Mostly due to a mill shutdown, capacity for these pulps will decline by an additional 56,000 tons during the survey period.

Thermomechanical Pulps

About three-quarters of all capacity gains in mechanical woodpulps during the 1981-1983 period will be from thermomechanical pulp (TMP) expansions. Six new installations will add 771,000 tons and, together with 48,000 tons from miscellaneous expansions, will bring the total capacity for these pulps to 2,159,000 tons in 1983. In 1975, the first year in which TMP capacity was reported in this survey, its share of all paper grade mechanical woodpulps was 3.1%. By 1983, its share will have increased to 35.3%.

Market Pulp

Bleached and semibleached sulphate market pulp capacity, which showed a 257,000 ton or 6.0% gain in 1980, will expand at a moderate rate, averaging 2.5% annually and reach a level of 4,834,000 tons in 1983. Increases will include the diversion of capacity from solid bleached paperboard and additional tonnage from the start-up of a new mill. No growth in capacity is reported for other market pulp grades.

Norma Pace
Senior Vice President
December, 1980

CAPACITY
PAPER AND PAPERBOARD

SUMMARY 1979–1983 ANNUAL Practical Maximum Basis

Thousands short tons

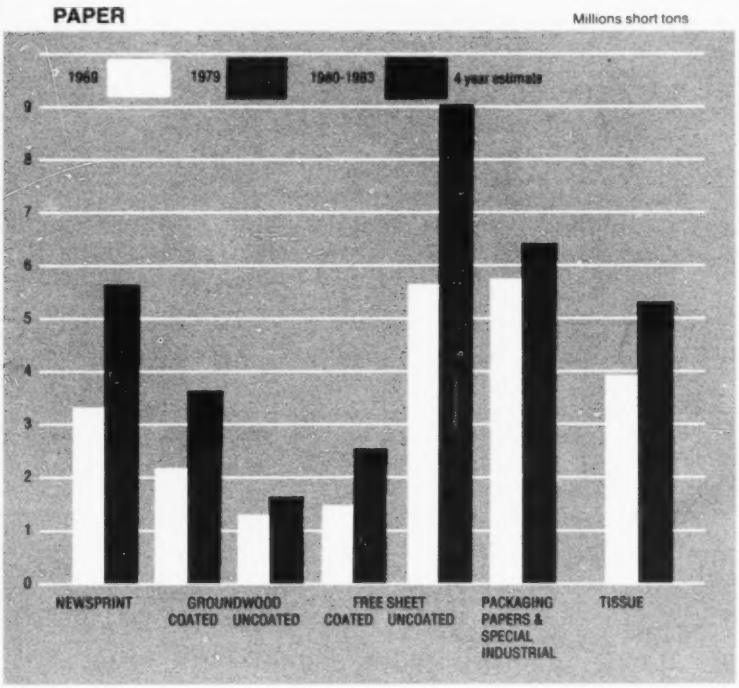
GRADES	1979	1980	1981	1982	1983 *
TOTAL ALL GRADES PAPER AND PAPERBOARD	**69,033**	**70,778**	**72,538**	**74,777**	**75,937**
TOTAL PAPER	**31,179**	**32,543**	**33,714**	**35,007**	**35,706**
NEWSPRINT	4,199	4,750	5,244	5,583	5,680
PRINTING, WRITING and RELATED	16,057	16,692	17,265	17,875	18,385
Uncoated Groundwood	1,541	1,522	1,525	1,644	1,716
Coated Groundwood	2,554	2,764	3,112	3,377	3,657
Coated Free Sheet	2,268	2,355	2,402	2,434	2,478
Uncoated Free Sheet	8,152	8,516	8,708	8,884	8,974
Cotton Fiber	134	136	137	139	140
Thin Papers	393	389	366	370	374
Solid Bleached Bristols	1,016	1,009	1,017	1,027	1,047
PACKAGING and INDUSTRIAL CONVERTING	6,053	6,141	6,170	6,329	6,377
Unbleached Kraft	4,098	4,165	4,174	4,321	4,353
Bleached Packaging and Industrial Converting†	1,105	1,106	1,124	1,128	1,132
Special Industrial	850	870	871	881	892
TISSUE	4,870	4,961	5,035	5,220	5,264
TOTAL PAPERBOARD	**33,436**	**33,817**	**34,454**	**35,398**	**35,859**
UNBLEACHED KRAFT	15,546	15,961	16,532	17,099	17,197
of which Kraft Linerboard	14,199	14,554	15,139	15,707	15,805
SOLID BLEACHED	4,268	4,265	4,222	4,260	4,279
SEMICHEMICAL	4,864	4,947	5,048	5,295	5,600
RECYCLED	8,757	8,644	8,652	8,745	8,783
TOTAL CONSTRUCTION PAPER AND BOARD AND OTHER	**4,419**	**4,418**	**4,370**	**4,371**	**4,372**

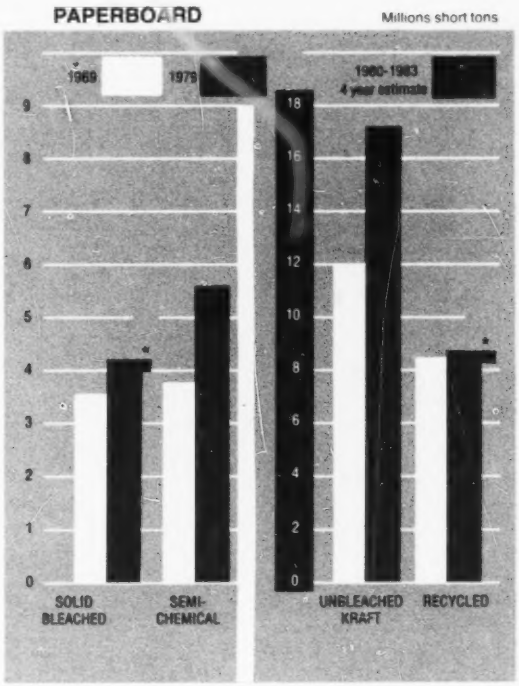
† *Includes specialty packaging papers.*

Totals not adjusted for rounding differences.

**Capacity additions presented here for 1983 include only presently known commitments and do not necessarily represent final expansion plans of the industry for that year.*

CAPACITY
ANNUAL GROWTH COMPARISON





*No growth projected

PAPER AND PAPERBOARD MILLS AND MACHINES SHUT DOWN

Thousands short tons GRADES	NUMBER OF MACHINES	NUMBER OF COMPLETE MILLS	ANNUAL CAPACITY
TOTAL 1970-1975	183	56	3,514
PAPER			
Printing-Writing	68	13	1,062
Pkg. & Ind. Conv.	24	6	222
Tissue	24	8	250
PAPERBOARD			
Unbl. Kraft	2	–	128
Bl. Kraft	2	–	61
Semichemical	6	2	248
Recycled	49	23	1,362
CONST. GRADES	8	4	181
TOTAL 1976-1977	61	14	1,010
PAPER			
Newsprint	2	1	141
Printing-Writing	19	2	168
Pkg. & Ind. Conv.	16	3	134
Tissue	5	2	51
PAPERBOARD			
Bl. Kraft	1	–	60
Recycled	15	4	417
CONST. GRADES	3	2	39

Thousands short tons GRADES	NUMBER OF MACHINES	NUMBER OF COMPLETE MILLS	ANNUAL CAPACITY
TOTAL 1978-1979	46	14	1,619
PAPER			
Newsprint	1	–	90
Printing-Writing	9	1	308
Pkg. & Ind. Conv.	8	1	223
Tissue	11	3	103
PAPERBOARD			
Unbl. Kraft	1	1	240
Bl. Kraft	1	1	102
Semichemical	2	–	145
Recycled	5	2	228
CONST. GRADES	8	5	180
TOTAL 1980-1982	39	14	935
PAPER			
Printing-Writing	10	1	186
Pkg. & Ind. Conv.	2	1	83
Tissue	7	3	82
PAPERBOARD			
Unbl. Kraft	2	–	195
Semichemical	2	1	33
Recycled	6	3	208
CONST. GRADES	10	5	148

Shutdowns represent machines and mills reported to the API as permanent or indefinite closures and have been removed from capacity totals. Not all of the facilities have been dismantled and some portion of their productive capacity could be restored.

CAPACITY
WOODPULP

SUMMARY 1979–1983 ANNUAL Practical Maximum Basis

Thousands short tons

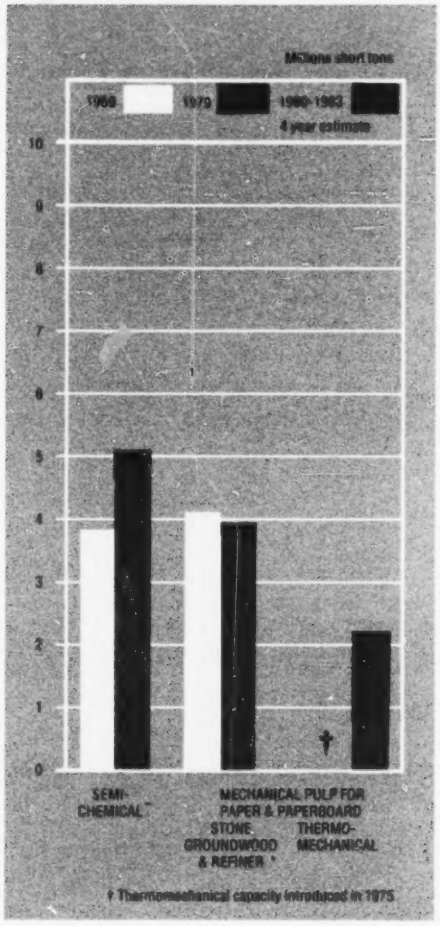
GRADES	1979	1980	1981	1982	1983*
TOTAL WOODPULP	**53,636**	**54,928**	**56,817**	**58,153**	**59,064**
DISSOLVING	1,551	1,579	1,579	1,579	1,579
CHEMICAL PAPER GRADES	40,897	41,667	42,918	43,752	44,171
SULPHITE PAPER GRADES	2,004	1,946	1,947	1,948	1,948
SULPHATE AND SODA PAPER GRADES	38,893	39,721	40,971	41,804	42,223
Bleached & Semibleached Softwood	10,897	11,336	11,807	11,999	12,100
Bleached & Semibleached Hardwood	8,072	8,235	8,353	8,492	8,604
Unbleached	19,923	20,150	20,811	21,313	21,518
SEMICHEMICAL	4,553	4,556	4,635	4,795	5,121
MECHANICAL	6,572	7,064	7,613	7,955	8,120
For Paper and Paperboard	4,573	5,062	5,620	5,959	6,124
For Other Paper and Board †	1,999	2,002	1,994	1,996	1,996
SCREENINGS	63	61	71	73	73
TOTAL MACHINE DRIED WOODPULP	**8,668**	**8,980**	**9,356**	**9,531**	**9,645**
DISSOLVING	1,551	1,579	1,579	1,579	1,579
CHEMICAL PAPER GRADES	6,925	7,212	7,587	7,763	7,877
SULPHITE	537	474	474	474	474
BLEACHED SULPHATE	6,266	6,601	6,977	7,154	7,267
UNBLEACHED SULPHATE	122	137	136	135	136
ALL OTHER	192	190	190	190	190

**Capacity additions presented here for 1983 include only presently known commitments and do not necessarily represent final expansion plans of the industry for that year.*

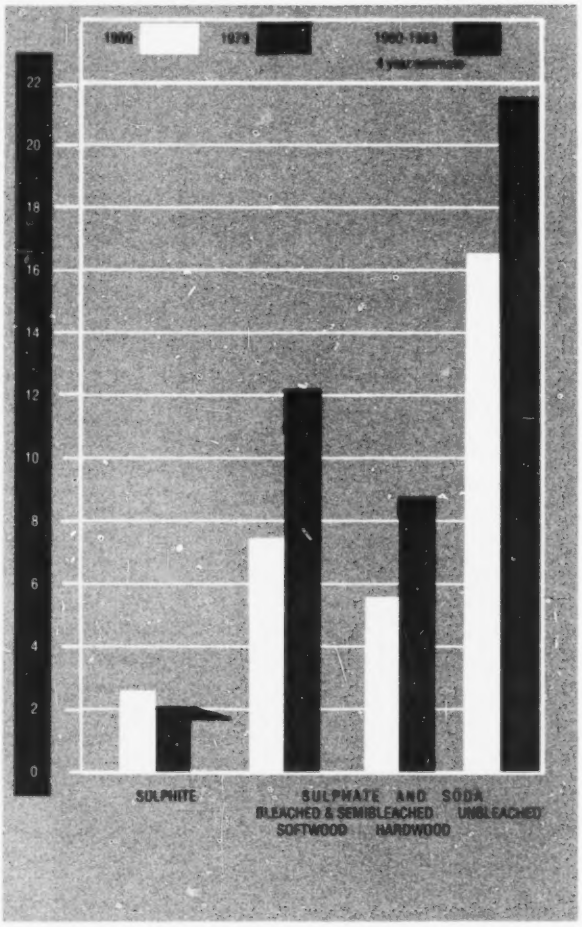
† Excludes the defibrated/exploded pulp capacity of mills that produce hard pressed board.

CAPACITY
ANNUAL GROWTH COMPARISON

WOODPULP
SEMICHEMICAL & MECHANICAL GRADES



WOODPULP
CHEMICAL PAPER GRADES



MARKET PULP CAPACITY

Based on information provided by producers. Reflects diversion of drying capacity to and from own use, installation of new equipment and retirement of existing equipment.

Thousands short tons

GRADES	1979	1980	1981	1982	1983*
TOTAL ALL GRADES	**6,334**	**6,579**	**6,798**	**6,851**	**6,928**
DISSOLVING	1,551	1,579	1,579	1,579	1,579
CHEMICAL PAPER GRADES	4,682	4,901	5,120	5,173	5,250
SULPHATE	4,332	4,601	4,820	4,873	4,950
Bleached and Semibleached	4,228	4,485	4,705	4,758	4,834
Unbleached	104	116	115	115	116
SULPHITE	350	300	300	300	300
ALL OTHER	101	99	99	99	99

* *Capacity additions presented here for 1983 include only presently known commitments and do not necessarily represent final expansion plans of the industry for that year.*

Totals not adjusted for rounding differences

CAPACITY
PAPER BY GRADE

	TOTAL ALL GRADES PAPER AND PAPER-BOARD		Practical Maximum Basis Thousands short tons	TOTAL PAPER	NEWS-PRINT	PRINTING, WRITING AND			
					Total	Total	Uncoated Ground-wood	Coated Ground-wood	Coated Free Sheet	Uncoated Free Sheet
ANNUAL CAPACITY 1979-1983	**69,033**	**1979**	**Annual Capacity**	**31,179**	**4,199**	**16,057**	**1,541**	**2,554**	**2,268**	**8,152**
	1,393		New Machines	1,033	541	331	1	97	—	233
	351		Net Improvements	332	10	304	(19)	113	87	132
	70,778	**1980**	**Annual Capacity**	**32,543**	**4,750**	**16,692**	**1,522**	**2,764**	**2,355**	**8,516**
	1,266		New Machines	728	372	292	4	112	—	176
	494		Net Improvements	443	122	281	(2)	236	47	16
	72,538	**1981**	**Annual Capacity**	**33,714**	**5,244**	**17,265**	**1,525**	**3,112**	**2,402**	**8,708**
	1,803		New Machines	1,031	186	514	99	233	—	182
	436		Net Improvements	263	154	96	20	33	32	(6)
	74,777	**1982**	**Annual Capacity**	**35,007**	**5,583**	**17,875**	**1,644**	**3,377**	**2,434**	**8,884**
	873		New Machines	467	4	425	66	277	—	82
	287		Net Improvements	232	92	86	7	2	43	8
	75,937	**1983***	**Annual Capacity**	**35,706**	**5,680**	**18,385**	**1,716**	**3,657**	**2,478**	**8,974**
YEAR END CAPACITY 1979-1983	**70,296**	**1979**	**Year End Capacity**	**32,130**	**4,636**	**16,432**	**1,544**	**2,649**	**2,342**	**8,368**
	1,332		New Machines	727	190	421	5	96	—	319
	(57)		Net Improvements	211	2	228	(40)	263	46	(25)
	71,571	**1980**	**Year End Capacity**	**33,067**	**4,828**	**17,080**	**1,509**	**3,008**	**2,388**	**8,662**
	1,251		New Machines	735	474	151	—	127	—	24
	639		Net Improvements	439	190	198	17	76	21	76
	73,461	**1981**	**Year End Capacity**	**34,241**	**5,492**	**17,430**	**1,526**	**3,211**	**2,409**	**8,762**
	1,712		New Machines	1,053	14	765	165	373	—	228
	271		Net Improvements	186	154	44	24	(1)	50	(50)
	75,443	**1982**	**Year End Capacity**	**35,481**	**5,660**	**18,239**	**1,715**	**3,583**	**2,459**	**8,940**
	391		New Machines	149	—	125	—	84	—	41
	371		Net Improvements	258	24	85	1	23	40	(1)
	76,205	**1983***	**Year End Capacity**	**35,888**	**5,685**	**18,449**	**1,716**	**3,691**	**2,499**	**8,979**
DAILY RATE 1979 - 1983	348	**1979**	Available Days	351	355	352	357	353	355	352
	202.15		**Daily Rate**	**91.57**	**13.04**	**46.62**	**4.33**	**7.50**	**6.60**	**23.78**
	348	**1980**	Available Days	351	355	352	353	355	354	352
	205.62		**Daily Rate**	**94.23**	**13.60**	**48.46**	**4.28**	**8.46**	**6.74**	**24.61**
	348	**1981**	Available Days	351	355	353	352	356	354	352
	210.98		**Daily Rate**	**97.56**	**15.48**	**49.44**	**4.33**	**9.03**	**6.80**	**24.88**
	348	**1982**	Available Days	351	355	353	352	356	354	352
	216.59		**Daily Rate**	**101.09**	**15.96**	**51.73**	**4.88**	**10.08**	**6.94**	**25.38**
	348	**1983***	Available Days	351	355	353	352	356	354	352
	218.77		**Daily Rate**	**102.24**	**16.03**	**52.32**	**4.88**	**10.38**	**7.06**	**25.49**

Annual Capacity includes changes in capacity only for the portion of the year in which they are actually effective.

Year End Capacity is calculated by multiplying Daily Rate by number of Available Days.

**Capacity additions presented here for 1983 include only presently known commitments and do not necessarily represent final expansion plans of the industry for that year.*

CONSTRUCTION PAPER AND BOARD

RELATED			PACKAGING AND INDUSTRIAL CONVERTING				TISSUE	CONSTRUCTION PAPER & BOARD & WET MACHINE BOARD			
Cotton Fiber	Thin Papers	Solid Bleached Bristols	Total	Unbleached Kraft	Bleached† Packaging and Industrial Converting	Special Industrial	Total	TOTAL	Construction Paper	Wet Machine Board	Insulating Board
134	**393**	**1,016**	**6,053**	**4,098**	**1,105**	**850**	**4,870**	**4,419**	**2,380**	**154**	**1,885**
—	—	—	4	—	—	4	157	17	—	—	17
3	(4)	(7)	84	67	2	[illegible]	(66)	(18)	(17)	7	(8)
136	**389**	**1,009**	**6,141**	**4,165**	**1,106**	**870**	**4,961**	**4,418**	**2,363**	**161**	**1,894**
—	—	—	—	—	—	—	64	—	—	—	—
1	(25)	8	29	10	18	[illegible]	10	(48)	(20)	(2)	(24)
137	**366**	**1,017**	**6,170**	**4,174**	**1,124**	**871**	**5,035**	**4,370**	**2,343**	**159**	**1,868**
—	—	—	201	201	—	—	130	—	—	—	—
2	4	10	(41)	(55)	4	[illegible]	54	2	1	—	—
139	**370**	**1,027**	**6,329**	**4,321**	**1,128**	**881**	**5,220**	**4,371**	**2,344**	**159**	**1,868**
—	—	—	20	20	—	—	19	—	—	—	—
1	4	21	28	13	4	[illegible]	25	1	1	—	—
140	**374**	**1,047**	**6,377**	**4,353**	**1,132**	**892**	**5,264**	**4,372**	**2,345**	**159**	**1,868**
136	**393**	**1,000**	**6,110**	**4,142**	**1,095**	**873**	**4,951**	**4,480**	**2,427**	**163**	**1,889**
—	—	—	—	—	—	—	117	—	—	—	—
—	(28)	11	89	68	27	(6)	(108)	(111)	(85)	(5)	(22)
136	**366**	**1,011**	**6,199**	**4,210**	**1,123**	**867**	**4,960**	**4,368**	**2,342**	**159**	**1,867**
—	—	—	—	—	—	—	110	—	—	—	—
2	—	7	(15)	(28)	3	10	66	2	1	—	1
139	**366**	**1,018**	**6,184**	**4,181**	**1,126**	**877**	**5,136**	**4,370**	**2,343**	**159**	**1,868**
—	—	—	203	203	—	—	71	—	—	—	—
1	8	10	(52)	(65)	5	8	40	2	2	—	—
140	**374**	**1,028**	**6,335**	**4,319**	**1,131**	**885**	**5,247**	**4,372**	**2,345**	**159**	**1,868**
—	—	—	24	24	—	—	—	—	—	—	—
1	—	22	127	108	2	16	22	—	—	—	—
140	**374**	**1,049**	**6,485**	**4,451**	**1,133**	**901**	**5,268**	**4,373**	**2,345**	**159**	**1,868**
313	342	354	344	352	342	311	350	324	326	322	322
.44	**1.15**	**2.82**	**17.77**	**11.76**	**3.20**	**2.81**	**14.14**	**13.82**	**7.45**	**.51**	**5.86**
313	341	353	345	353	344	311	350	329	328	324	331
.44	**1.07**	**2.87**	**17.99**	**11.94**	**3.26**	**2.79**	**14.19**	**13.27**	**7.14**	**.49**	**5.64**
313	341	353	345	353	344	311	350	329	328	324	331
.44	**1.07**	**2.88**	**17.95**	**11.86**	**32.7**	**2.82**	**14.69**	**13.28**	**7.14**	**.49**	**5.64**
314	342	353	345	353	344	311	350	329	328	324	331
.45	**1.09**	**2.91**	**18.39**	**12.25**	**32.9**	**2.85**	**15.01**	**13.28**	**7.15**	**.49**	**5.64**
314	342	353	345	353	343	311	350	329	328	324	331
.45	**1.09**	**2.97**	**18.81**	**12.62**	**33.0**	**2.90**	**15.07**	**13.28**	**7.15**	**.49**	**5.64**

† *Includes specialty packaging papers.*

Totals not adjusted for rounding differences.

CAPACITY
PAPERBOARD BY GRADE

		Practical Maximum Basis Thousands short tons	TOTAL PAPER-BOARD	UNBLEACHED KRAFT PAPERBOARD				SOLID
				Total	Liner-board	Folding	Other	Total
ANNUAL CAPACITY 1979-1983	**1979**	**Annual Capacity**	**33,436**	**15,546**	**14,199**	**827**	**520**	**4,268**
		New Machines	344	281	251	30	–	–
		Net Improvements	37	134	104	31	(2)	(4)
	1980	**Annual Capacity**	**33,817**	**15,961**	**14,554**	**889**	**518**	**4,265**
		New Machines	538	532	532	–	–	–
		Net Improvements	99	39	53	(19)	5	(42)
	1981	**Annual Capacity**	**34,454**	**16,532**	**15,139**	**870**	**523**	**4,222**
		New Machines	772	576	576	–	–	–
		Net Improvements	172	(9)	(8)	(2)	–	38
	1982	**Annual Capacity**	**35,398**	**17,099**	**15,707**	**868**	**524**	**4,260**
		New Machines	406	148	148	–	–	–
		Net Improvements	54	(50)	(50)	–	–	19
	1983*	**Annual Capacity**	**35,859**	**17,197**	**15,805**	**868**	**524**	**4,279**
YEAR END CAPACITY 1979-1983	**1979**	**Year End Capacity**	**33,687**	**15,771**	**14,367**	**888**	**515**	**4,307**
		New Machines	605	548	548	–	–	–
		Net Improvements	(156)	12	5	–	6	(125)
	1980	**Year End Capacity**	**34,135**	**16,331**	**14,921**	**889**	**522**	**4,181**
		New Machines	516	516	516	–	–	–
		Net Improvements	197	12	31	(20)	2	54
	1981	**Year End Capacity**	**34,849**	**16,860**	**15,468**	**868**	**523**	**4,235**
		New Machines	658	390	390	–	–	–
		Net Improvements	83	(88)	(88)	–	–	42
	1982	**Year End Capacity**	**35,590**	**17,163**	**15,771**	**868**	**524**	**4,277**
		New Machines	242	35	35	–	–	–
		Net Improvements	113	41	40	–	–	1
	1983*	**Year End Capacity**	**35,945**	**17,239**	**15,846**	**868**	**524**	**4,279**
DAILY RATE 1979 - 1983	**1979**	Available Days	348	353	353	351	358	356
		Daily Rate	**96.77**	**44.63**	**40.66**	**2.53**	**1.44**	**12.09**
	1980	Available Days	348	353	353	351	357	356
		Daily Rate	**98.12**	**46.26**	**42.27**	**2.53**	**1.46**	**11.75**
	1981	Available Days	348	353	353	351	357	356
		Daily Rate	**100.14**	**47.75**	**43.81**	**2.47**	**1.47**	**11.90**
	1982	Available Days	348	353	353	351	357	356
		Daily Rate	**102.22**	**48.59**	**44.65**	**2.47**	**1.47**	**12.02**
	1983*	Available Days	348	353	353	351	357	356
		Daily Rate	**103.25**	**48.81**	**44.87**	**2.47**	**1.47**	**12.03**

Annual Capacity includes changes in capacity only for the portion of the year in which they are actually effective.

Year End Capacity is calculated by multiplying Daily Rate by number of Available Days.

**Capacity additions presented here for 1983 include only presently known commitments and do not necessarily represent final expansion plans of the industry for that year.*

BLEACHED PACKAGING PAPERBOARD				SEMI-CHEMICAL PAPERBOARD	RECYCLED PAPERBOARD							
Linerboard	Folding	Milk Carton & Food Service	Other	Total	Total	Linerboard	Corrugating Medium	Container Chip and Filler Board	Folding	Set-up	Gypsum Wall Board Facing	Other
137	**2,061**	**1,877**	**193**	**4,864**	**8,757**	**432**	**1,392**	**287**	**2,615**	**404**	**1,273**	**2,355**
–	–	–	–	12	50	–	–	–	50	–	–	–
8	(6)	(34)	28	71	(163)	27	(33)	(9)	(115)	(12)	14	(37)
145	**2,056**	**1,843**	**221**	**4,947**	**8,644**	**459**	**1,359**	**279**	**2,550**	**392**	**1,287**	**2,318**
–	–	–	–	–	6	–	–	–	6	–	–	–
–	27	(72)	3	101	1	(3)	9	(2)	(32)	(11)	11	29
145	**2,082**	**1,771**	**225**	**5,048**	**8,652**	**456**	**1,368**	**277**	**2,524**	**381**	**1,298**	**2,348**
–	–	–	–	196	–	–	–	–	–	–	–	–
–	32	3	2	51	93	43	8	1	10	2	14	15
145	**2,114**	**1,774**	**227**	**5,295**	**8,745**	**499**	**1,376**	**277**	**2,534**	**383**	**1,313**	**2,363**
–	–	–	–	258	–	–	–	–	–	–	–	–
–	7	11	1	47	38	13	2	1	7	2	10	4
145	**2,121**	**1,785**	**228**	**5,600**	**8,783**	**512**	**1,378**	**278**	**2,541**	**385**	**1,322**	**2,367**
144	**2,049**	**1,892**	**221**	**4,807**	**8,802**	**463**	**1,446**	**281**	**2,589**	**401**	**1,283**	**2,340**
–	–	–	–	–	56	–	–	–	56	–	–	–
–	(1)	(125)	–	197	(240)	(6)	(86)	(4)	(127)	(21)	7	(4)
145	**2,048**	**1,767**	**222**	**5,005**	**8,618**	**457**	**1,360**	**277**	**2,518**	**380**	**1,290**	**2,337**
–	–	–	–	–	–	–	–	–	–	–	–	–
–	46	4	4	65	66	(1)	13	1	14	2	17	20
145	**2,094**	**1,772**	**225**	**5,070**	**8,684**	**456**	**1,373**	**277**	**2,532**	**382**	**1,307**	**2,357**
–	–	–	–	268	–	–	–	–	–	–	–	–
–	25	15	2	52	77	47	3	1	5	2	11	9
145	**2,119**	**1,787**	**227**	**5,389**	**8,760**	**503**	**1,376**	**278**	**2,537**	**384**	**1,317**	**2,366**
–	–	–	–	207	–	–	–	–	–	–	–	–
–	3	(2)	1	38	33	10	2	–	9	2	9	1
145	**2,122**	**1,785**	**228**	**5,634**	**8,793**	**513**	**1,378**	**278**	**2,545**	**385**	**1,326**	**2,367**
352	356	357	354	352	333	339	340	332	331	319	340	329
.41	**5.76**	**5.30**	**.63**	**13.64**	**26.41**	**1.36**	**4.25**	**.84**	**7.81**	**1.26**	**3.77**	**7.11**
352	356	357	353	352	333	339	340	332	328	322	340	330
.41	**5.76**	**4.96**	**.63**	**14.20**	**25.91**	**1.35**	**4.00**	**.83**	**7.67**	**1.18**	**3.79**	**7.08**
352	356	357	353	352	333	339	340	332	328	322	340	330
.41	**5.89**	**4.97**	**.64**	**14.38**	**26.11**	**1.34**	**4.04**	**.84**	**7.71**	**1.19**	**3.85**	**7.14**
352	356	357	353	353	333	339	340	332	328	322	339	330
.41	**5.96**	**5.01**	**.64**	**15.28**	**26.33**	**1.48**	**4.05**	**.84**	**7.73**	**1.19**	**3.88**	**7.16**
352	356	357	353	352	333	339	340	332	328	322	339	330
.41	**5.96**	**5.01**	**.65**	**15.99**	**26.43**	**1.51**	**4.06**	**.84**	**7.75**	**1.20**	**3.91**	**7.17**

Totals not adjusted for rounding differences.

CAPACITY
WOODPULP BY GRADE

Practical Maximum Basis

Thousands short tons

			TOTAL WOOD PULP	DISSOLVING	CHEMICAL				PAPER	
						SULPHITE			SULPHATE	
										Bleached &
				Total	Total	Total	Bleached	Unbleached	Total	Hardwood
ANNUAL CAPACITY 1979-1983	**1979**	**Annual Capacity**	**53,636**	**1,551**	**40,897**	**2,004**	**1,595**	**409**	**38,893**	**8,072**
		New Machines	999	–	456	–	–	–	456	126
		Net Improvements	293	28	315	(58)	(59)	1	373	37
Annual Capacity includes changes in capacity only for the portion of the year in which they are actually effective	**1980**	**Annual Capacity**	**54,928**	**1,579**	**41,667**	**1,946**	**1,537**	**409**	**39,721**	**8,235**
		New Machines	1,425	–	879	–	–	–	879	113
		Net Improvements	464	–	372	1	1	–	371	5
	1981	**Annual Capacity**	**56,817**	**1,579**	**42,918**	**1,947**	**1,538**	**409**	**40,971**	**8,353**
		New Machines	985	–	560	–	–	–	560	59
		Net Improvements	352	–	274	1	1	–	273	80
	1982	**Annual Capacity**	**58,153**	**1,579**	**43,752**	**1,948**	**1,539**	**409**	**41,804**	**8,492**
		New Machines	654	–	230	–	–	–	230	31
		Net Improvements	256	–	188	–	–	–	188	81
	1983*	**Annual Capacity**	**59,064**	**1,579**	**44,171**	**1,948**	**1,539**	**409**	**42,223**	**8,604**
YEAR END CAPACITY 1979-1983	**1979**	**Year End Capacity**	**54,228**	**1,579**	**41,158**	**1,946**	**1,536**	**409**	**39,212**	**8,065**
		New Machines	1,318	–	955	–	–	–	955	223
		Net Improvements	381	–	343	–	–	–	343	54
Year End Capacity is calculated by multiplying Daily Rate by number of Available Days	**1980**	**Year End Capacity**	**55,927**	**1,579**	**42,456**	**1,946**	**1,537**	**409**	**40,510**	**8,343**
		New Machines	1,152	–	605	–	–	–	605	21
		Net Improvements	357	–	257	2	2	–	255	23
	1981	**Year End Capacity**	**57,436**	**1,579**	**43,317**	**1,948**	**1,539**	**409**	**41,369**	**8,387**
		New Machines	928	–	456	–	–	–	456	70
		Net Improvements	380	–	270	–	–	–	270	91
	1982	**Year End Capacity**	**58,744**	**1,579**	**44,044**	**1,948**	**1,539**	**409**	**42,096**	**8,548**
		New Machines	415	–	62	–	–	–	62	19
		Net Improvements	8	–	97	–	–	–	97	50
	1983*	**Year End Capacity**	**59,167**	**1,579**	**44,203**	**1,948**	**1,539**	**409**	**42,255**	**8,618**
DAILY RATE 1979 - 1983	**1979**	Available Days	354	349	355	354	352	360	355	355
		Daily Rate	**153.31**	**4.52**	**115.89**	**5.50**	**4.36**	**1.14**	**110.39**	**22.70**
	1980	Available Days	354	349	355	354	352	360	355	355
		Daily Rate	**157.90**	**4.52**	**119.54**	**5.50**	**4.36**	**1.14**	**114.04**	**23.49**
	1981	Available Days	354	349	355	354	352	360	355	355
		Daily Rate	**162.13**	**4.52**	**121.97**	**5.50**	**4.37**	**1.14**	**116.46**	**23.61**
	1982	Available Days	354	349	355	354	352	360	355	355
		Daily Rate	**165.81**	**4.52**	**124.01**	**5.50**	**4.37**	**1.14**	**118.50**	**24.06**
	1983*	Available Days	354	349	355	354	352	360	355	355
		Daily Rate	**167.01**	**4.52**	**124.46**	**5.50**	**4.37**	**1.14**	**118.95**	**24.26**

**Capacity additions presented here for 1983 include only presently known commitments and do not necessarily represent final expansion plans of the industry for that year.*

GRADES AND SODA		SEMICHEMICAL			MECHANICAL								SCREENINGS
						For Paper & Paperboard				For Other Paper and Board			
Semi-bleached Soft-wood	Unbleached	Total	Bleached	Unbleached	Total	Total	Stone Groundwood	Refiner	Thermo-mechanical	Total	Stone Groundwood and Refiner	Defibrated/ Exploded †	Total
10,897	**19,923**	**4,553**	**336**	**4,217**	**6,572**	**4,573**	**3,255**	**507**	**811**	**1,999**	**594**	**1,406**	**63**
189	141	3	—	3	540	540	16	—	524	—	—	—	—
250	86	—	7	(7)	(48)	(51)	(47)	(8)	5	3	43	(41)	(2)
11,336	**20,150**	**4,556**	**343**	**4,213**	**7,064**	**5,062**	**3,224**	**498**	**1,340**	**2,002**	**637**	**1,365**	**61**
344	421	56	—	56	490	490	31	—	459	—	—	—	—
126	240	22	4	18	60	68	31	17	20	(8)	25	(34)	10
11,807	**20,811**	**4,635**	**348**	**4,288**	**7,613**	**5,620**	**3,286**	**515**	**1,819**	**1,994**	**662**	**1,331**	**71**
113	388	129	—	129	297	297	69	—	228	—	—	—	—
79	114	31	2	29	45	43	—	20	23	2	2	—	1
11,999	**21,313**	**4,795**	**349**	**4,446**	**7,955**	**5,959**	**3,355**	**535**	**2,069**	**1,996**	**664**	**1,331**	**73**
41	158	289	121	168	135	135	51	—	84	—	—	—	—
60	47	37	—	37	31	31	(11)	36	6	—	—	—	—
12,100	**21,518**	**5,121**	**471**	**4,651**	**8,120**	**6,124**	**3,395**	**571**	**2,159**	**1,996**	**664**	**1,331**	**73**
11,152	**19,996**	**4,515**	**341**	**4,174**	**6,915**	**4,887**	**3,200**	**496**	**1,191**	**2,028**	**637**	**1,392**	**61**
367	364	13	—	13	350	350	40	—	310	—	—	—	—
138	150	38	5	33	—	60	38	13	9	(60)	—	(60)	—
11,657	**20,511**	**4,566**	**346**	**4,220**	**7,265**	**5,297**	**3,278**	**508**	**1,511**	**1,968**	**637**	**1,331**	**61**
168	415	64	—	64	483	483	13	—	471	—	—	—	—
96	135	32	4	28	58	30	—	7	22	28	28	—	11
11,920	**21,061**	**4,661**	**349**	**4,312**	**7,806**	**5,811**	**3,292**	**516**	**2,003**	**1,996**	**664**	**1,331**	**72**
77	309	280	—	280	192	192	105	—	87	—	—	—	—
79	100	37	—	37	72	72	—	49	23	—	—	—	—
12,077	**21,471**	**4,978**	**349**	**4,629**	**8,070**	**6,074**	**3,397**	**565**	**2,113**	**1,996**	**664**	**1,331**	**73**
18	26	166	166	—	187	187	128	—	59	—	—	—	—
19	29	27	—	27	(116)	(116)	(126)	7	3	—	—	—	—
12,113	**21,525**	**5,171**	**515**	**4,656**	**8,141**	**6,145**	**3,398**	**571**	**2,176**	**1,996**	**664**	**1,331**	**73**
355	355	352	354	351	348	356	356	357	358	329	352	319	360
31.42	**56.27**	**12.84**	**.96**	**11.88**	**19.89**	**13.71**	**9.00**	**1.39**	**3.33**	**6.17**	**1.81**	**4.36**	**.17**
355	355	352	354	352	351	356	356	356	358	337	352	330	360
32.84	**57.72**	**12.97**	**.98**	**11.99**	**20.70**	**14.86**	**9.22**	**1.43**	**4.22**	**5.84**	**1.81**	**4.03**	**.17**
355	355	352	354	352	352	357	356	356	358	337	352	330	360
33.59	**59.26**	**13.23**	**.99**	**12.24**	**22.21**	**16.29**	**9.25**	**1.45**	**5.59**	**5.92**	**1.89**	**4.03**	**.20**
355	355	353	354	352	352	356	356	356	358	337	352	330	360
34.04	**60.41**	**14.12**	**.99**	**13.13**	**22.96**	**17.04**	**9.55**	**1.59**	**5.90**	**5.92**	**1.89**	**4.03**	**.20**
355	355	352	351	352	352	356	356	356	358	337	352	330	360
34.14	**60.56**	**14.68**	**1.47**	**13.21**	**23.16**	**17.24**	**9.56**	**1.61**	**6.08**	**5.92**	**1.89**	**4.03**	**.20**

† *Excludes the defibrated/exploded pulp capacity of mills that produce hard pressed board.*

Totals not adjusted for rounding differences.

CAPACITY
REGIONAL DISTRIBUTION PAPER/PAPERBOARD
1979–1983

TOTAL U.S. CAPACITY		GRADES	NEW ENGLAND		MID-ATLANTIC	
1979	1983	Practical Maximum Basis/ Thousands short tons	1979	1983	1979	1983
69,033	**75,937**	**TOTAL ALL GRADES PAPER AND PAPERBOARD**	**5,664**	**6,189**	**6,540**	**6,654**
31,179	**35,706**	**TOTAL PAPER**	**4,586**	**5,141**	**3,869**	**4,055**
4,199	5,680	NEWSPRINT	341	318	192	206
16,057	18,385	PRINTING WRITING AND RELATED	3,247	3,785	2,257	2,396
1,016	1,047	of which Solid Bleached Bristols	70	84	18	16
6,053	6,377	PACKAGING AND INDUSTRIAL CONV.	489	500	239	240
4,870	5,264	TISSUE	510	538	1,181	1,213
33,436	**35,859**	**TOTAL PAPERBOARD**	**891**	**868**	**1,941**	**1,961**
15,546	17,197	UNBLEACHED KRAFT	—	—	—	—
14,199	15,805	of which Kraft Linerboard	—	—	—	—
4,268	4,279	SOLID BLEACHED	35	34	—	—
4,864	5,600	SEMICHEMICAL	195	196	—	—
8,757	8,783	RECYCLED	660	638	1,941	1,961
4,419	**4,372**	**TOTAL CONSTRUCTION PAPER AND BOARD**	**187**	**180**	**729**	**638**
2,380	2,345	CONSTRUCTION PAPER	94	86	489	388
154	159	WET MACHINE BOARD	37	35	53	60
1,885	1,868	INSULATING BOARD	55	59	187	190
53,636	**59,064**	**TOTAL WOODPULP**	**3,252**	**3,488**	**1,452**	**1,466**
1,551	1,579	DISSOLVING	—	—	—	—
2,004	1,948	SULPHITE PAPER GRADES	252	252	243	245
1,595	1,539	Bleached	—	—	243	245
409	409	Unbleached	252	252	—	—
38,893	42,223	SULPHATE AND SODA PAPER GRADES	1,792	1,879	471	485
10,897	12,100	Bleached & Semibleached Softwood	783	882	133	147
8,072	8,604	Bleached & Semibleached Hardwood	931	948	338	338
19,923	21,518	Unbleached	78	50	—	—
4,553	5,121	SEMICHEMICAL	148	143	353	370
6,572	8,120	MECHANICAL	1,060	1,213	385	366
4,573	6,124	For Paper and Paperboard	928	1,081	218	228
1,999	1,996	For Other Paper and Board †	132	132	167	138
63	73	SCREENINGS	—	—	—	—

† Excludes the defibrated/exploded pulp capacity of mills that produce hard pressed board

/WOODPULP

E. NO. CENTRAL		W. NO. CENTRAL		SO. ATLANTIC		E. SO. CENTRAL		W. SO. CENTRAL		MOUNTAIN and PACIFIC*	
1979	1983	1979	1983	1979	1983	1979	1983	1979	1983	1979	1983
11,066	**11,893**	**1,842**	**2,005**	**16,397**	**17,699**	**8,054**	**9,390**	**9,998**	**11,617**	**9,473**	**10,490**
6,004	**6,734**	**832**	**996**	**4,407**	**5,115**	**3,134**	**3,690**	**4,185**	**4,803**	**4,161**	**5,173**
138	151	–	–	458	725	918	1,064	1,054	1,432	1,098	1,783
3,952	4,538	830	995	1,900	1,988	1,184	1,589	1,382	1,525	1,304	1,570
79	87	–	–	261	292	78	66	453	447	58	55
677	756	1	1	1,703	1,950	523	521	1,449	1,428	972	981
1,237	1,290	–	–	346	451	508	517	300	418	787	838
4,254	**4,340**	**441**	**432**	**11,229**	**11,803**	**4,531**	**5,316**	**5,178**	**6,174**	**4,970**	**4,966**
–	–	–	–	7,174	7,649	2,815	3,342	2,977	3,585	2,580	2,621
–	–	–	–	6,667	7,155	2,519	3,016	2,476	3,060	2,538	2,573
–	–	–	–	1,858	1,834	716	752	1,175	1,234	483	424
1,290	1,577	132	61	1,145	1,128	651	871	708	1,031	743	736
2,964	2,762	308	371	1,053	1,192	349	350	319	325	1,164	1,184
808	**820**	**570**	**577**	**760**	**781**	**389**	**385**	**634**	**640**	**341**	**350**
594	634	222	233	256	266	97	98	370	373	257	266
29	29	–	–	13	13	22	22	–	–	–	–
185	157	348	345	491	503	270	265	265	267	84	84
3,431	**3,708**	**944**	**945**	**16,766**	**18,071**	**8,679**	**9,798**	**9,824**	**11,466**	**9,288**	**10,122**
–	–	–	–	607	647	215	206	–	–	729	725
532	535	–	–	–	–	–	–	–	–	977	917
524	527	–	–	–	–	–	–	–	–	828	767
8	8	–	–	–	–	–	–	–	–	149	150
1,012	1,050	275	290	14,473	15,447	6,946	7,738	8,059	9,029	5,865	6,304
277	268	86	80	3,086	3,681	1,762	1,820	2,349	2,483	2,421	2,738
528	572	172	192	2,621	2,588	1,952	2,269	1,446	1,611	85	87
207	210	18	18	8,766	9,178	3,232	3,648	4,264	4,935	3,359	3,479
1,232	1,343	170	99	875	887	577	710	603	966	594	602
654	780	498	556	799	1,074	941	1,145	1,123	1,421	1,112	1,566
290	436	194	243	358	580	738	956	886	1,186	961	1,415
364	344	304	313	441	494	203	189	237	235	151	151
–	–	–	–	13	15	–	–	40	50	10	7

Totals not adjusted for rounding differences. **Includes non-continental U.S.*

FIBER SOURCES FOR PAPER/PAPERBOARD/WOODPULP

FIBER CONSUMPTION IN PAPER AND PAPERBOARD MANUFACTURE

Thousands short tons

	Total U.S.	Percent of Total Fiber	New England	Mid-Atlantic	East-North Central	West-North Central	South Atlantic	East-South Central	West-South Central	Mountain and Pacific
1979										
TOTAL CONSUMPTION	**66,699**	**100.0**	**5,340**	**5,782**	**10,485**	**1,542**	**16,670**	**8,007**	**9,539**	**9,335**
TOTAL WOODPULP	50,436	75.6	4,008	3,042	5,485	966	14,360	7,118	8,392	7,064
Manufactured on-site	41,914	62.8	2,114	1,221	2,567	675	13,879	6,884	8,212	6,363
*Purchased & transferred	8,522	12.8	1,894	1,821	2,918	291	482	234	180	701
† TOTAL WASTE PAPER	15,520	23.3	1,229	2,685	4,929	512	2,169	851	953	2,192
Mixed Papers	2,648	4.0	242	583	753	130	426	132	196	186
Newspapers	2,480	3.7	137	651	672	63	317	91	112	436
Corrugated	6,967	10.4	339	760	2,226	261	1,169	496	417	1,299
Pulp Substitutes	2,308	3.5	346	525	613	58	256	132	145	233
High Grade Deinking	1,117	1.7	165	165	666	—	—	—	82	38
OTHER FIBERS	744	1.1	104	56	71	63	141	38	193	77
1980										
TOTAL FIBER	**68,579**	**100.0**	**5,408**	**5,607**	**10,505**	**1,429**	**17,270**	**8,483**	**10,042**	**9,835**
TOTAL WOODPULP	52,242	76.2	4,060	3,006	5,563	887	14,859	7,563	8,818	7,486
Manufactured on-site	43,804	63.9	2,171	1,238	2,717	634	14,381	7,316	8,612	6,734
*Purchased & transferred	8,438	12.3	1,889	1,768	2,846	253	478	247	205	751
† TOTAL WASTE PAPER	15,606	22.7	1,238	2,544	4,873	477	2,285	882	1,030	2,276
Mixed Papers	2,548	3.7	236	526	737	127	441	137	181	163
Newspapers	2,517	3.7	149	628	654	57	344	95	121	468
Corrugated	7,013	10.2	330	704	2,189	236	1,236	515	465	1,337
Pulp Substitutes	2,341	3.4	352	524	598	56	264	135	149	264
High Grade Deinking	1,187	1.7	172	162	695	—	—	—	114	44
OTHER FIBERS	730	1.1	109	56	68	66	126	37	194	73
1981										
TOTAL FIBER	**72,252**	**100.0**	**5,597**	**5,767**	**11,195**	**1,612**	**17,918**	**8,895**	**10,668**	**10,600**
TOTAL WOODPULP	54,896	76.0	4,206	3,114	5,943	1,028	15,239	7,927	9,325	8,113
Manufactured on-site	46,009	63.7	2,272	1,280	2,884	781	14,673	7,675	9,118	7,325
*Purchased & transferred	8,887	12.3	1,934	1,834	3,058	247	566	252	207	788
† TOTAL WASTE PAPER	16,586	22.9	1,272	2,595	5,179	518	2,545	924	1,143	2,411
Mixed Papers	2,722	3.8	245	556	780	139	469	152	198	184
Newspapers	2,731	3.8	157	676	699	65	384	100	131	518
Corrugated	7,480	10.3	333	671	2,333	257	1,405	529	558	1,395
Pulp Substitutes	2,404	3.3	364	516	625	58	288	144	140	270
High Grade Deinking	1,250	1.7	173	176	741	—	—	—	116	44
OTHER FIBERS	770	1.1	119	58	73	*66	134	44	200	76
1982										
TOTAL FIBER	**74,652**	**100.0**	**5,741**	**5,858**	**11,460**	**1,711**	**18,339**	**9,162**	**11,516**	**10,865**
TOTAL WOODPULP	56,677	75.9	4,322	3,164	6,116	1,056	15,464	8,148	10,015	8,302
Manufactured on-site	47,515	63.6	2,341	1,289	2,945	803	14,896	7,855	9,887	7,499
*Purchased & transferred	9,162	12.3	1,980	1,876	3,171	254	568	294	217	803
† TOTAL WASTE PAPER	17,201	23.0	1,296	2,636	5,271	589	2,741	970	1,211	2,486
Mixed Papers	2,759	3.8	250	561	791	141	477	152	202	184
Newspapers	2,831	3.8	159	691	701	71	386	100	144	578
Corrugated	7,864	10.3	341	680	2,379	314	1,589	572	584	1,406
Pulp Substitutes	2,436	3.3	372	523	617	62	289	146	152	275
High Grade Deinking	1,310	1.8	175	180	782	—	—	—	129	44
OTHER FIBERS	774	1.1	122	58	73	66	135	44	200	76

Totals not adjusted for rounding differences.

* *Comprises all dried, wet lap or slush pulp not produced on-site including transfers from company owned or affiliated mills.*

† *Includes construction grades and molded pulp products.*

MANUFACTURE 1979–1983

Fiber Definitions Used In This Survey

1979 - Actual consumption
1980 - Consumption calculated on the basis of estimated production for 1980 and reflecting production cutbacks, losses due to strikes, etc.
1981
1983 - Consumption of capacity levels of production

FIBER CONSUMPTION IN PAPER AND PAPERBOARD MANUFACTURE

Thousands short tons

	Total U.S.	Percent of Total Fiber	New England	Mid-Atlantic	East-North Central	West-North Central	South Atlantic	East-South Central	West-South Central	Mountain and Pacific
1983										
TOTAL FIBER	**75,604**	**100.0**	**5,801**	**5,897**	**11,560**	**1,770**	**18,439**	**9,474**	**11,695**	**10,967**
TOTAL WOODPULP	57,313	75.8	4,375	3,181	6,194	1,115	15,522	8,399	10,186	8,340
Manufactured on-site	48,062	63.6	2,377	1,294	2,988	836	14,959	8,093	9,976	7,538
*Purchased & transferred	9,251	12.2	1,998	1,887	3,206	279	563	306	210	801
† TOTAL WASTE PAPER	17,514	23.2	1,300	2,658	5,293	589	2,783	1,031	1,308	2,552
Mixed Papers	2,775	3.7	250	566	795	141	483	153	203	185
Newspapers	2,900	3.8	160	695	703	71	387	100	146	638
Corrugated	8,063	10.7	341	685	2,383	314	1,621	631	678	1,409
Pulp Substitutes	2,454	3.3	373	531	621	62	292	147	152	276
High Grade Deinking	1,321	1.7	177	181	791	—	—	—	129	44
OTHER FIBERS	778	1.0	126	59	73	66	135	44	200	76

PULPWOOD CONSUMPTION IN WOODPULP MANUFACTURE

Thousands of Cords ■

1979										
TOTAL CONSUMPTION	**79,189**	**100.0**	**4,869**	**1,919**	**4,760**	**1,116**	**24,728**	**12,285**	**13,906**	**15,607**
Roundwood and Roundwood Chips	45,101	57.0	3,547	1,594	3,436	857	16,437	8,577	8,552	2,101
Forest Residues	4,605	5.8	155	69	460	123	1,867	134	893	902
Manufacturing Residues	29,483	37.2	1,167	256	864	135	6,424	3,574	4,461	12,602
1980										
TOTAL PULPWOOD	**83,214**	**100.0**	**4,939**	**1,962**	**4,876**	**1,032**	**25,558**	**13,400**	**14,792**	**16,655**
Roundwood and Roundwood Chips	48,757	58.6	3,707	1,638	3,462	832	16,656	9,559	9,280	3,624
Forest Residues	4,775	5.7	140	64	517	96	1,817	135	1,098	908
Manufacturing Residues	29,682	35.7	1,092	261	897	105	7,085	3,706	4,415	12,122
1981										
TOTAL PULPWOOD	**87,524**	**100.0**	**5,252**	**2,010**	**5,050**	**1,198**	**26,222**	**14,158**	**15,503**	**18,132**
Roundwood and Roundwood Chips	50,336	57.5	4,036	1,671	3,607	862	16,812	10,228	9,434	3,686
Forest Residues	5,186	5.9	155	69	558	219	1,993	146	1,095	952
Manufacturing Residues	32,002	36.6	1,061	269	885	117	7,418	3,785	4,974	13,494
1982										
TOTAL PULPWOOD	**89,710**	**100.0**	**5,350**	**2,020**	**5,097**	**1,220**	**26,780**	**14,434**	**16,462**	**18,347**
Roundwood and Roundwood Chips	51,026	56.9	4,133	1,675	3,637	884	17,075	10,418	9,941	3,263
Forest Residues	5,251	5.9	155	71	572	219	1,992	147	1,129	966
Manufacturing Residues	33,434	37.2	1,061	275	889	117	7,714	3,868	5,392	14,118
1983										
TOTAL PULPWOOD	**90,576**	**100.0**	**5,388**	**2,020**	**5,127**	**1,254**	**27,040**	**14,725**	**16,638**	**18,385**
Roundwood and Roundwood Chips	51,645	57.0	4,172	1,674	3,657	918	17,196	10,673	10,057	3,297
Forest Residues	5,301	5.9	155	72	578	219	2,018	147	1,131	982
Manufacturing Residues	33,630	37.1	1,061	274	891	117	7,826	3,905	5,450	14,106

Totals not adjusted for rounding differences.

WASTE PAPER IN PAPER AND PAPERBOARD MANUFACTURE

ACTUAL CONSUMPTION — 1979

END PRODUCT Thousands short tons	U.S. Paper & Paperboard Production	Total Waste Paper Consumption	GRADES OF PAPER STOCK Mixed Papers	News-papers	Corru-gated	Pulp Substitutes	High Grade Deinking
TOTAL ALL GRADES	**64,556**	**15,520**	**2,650**	**2,478**	**6,967**	**2,308**	**1,117**
TOTAL PAPER	**29,661**	**3,485**	**107**	**812**	**194**	**1,373**	**999**
NEWSPRINT	4,062	714	—	679	—	35	—
PRINTING, WRITING AND RELATED	15,368	839	9	—	—	525	305
UNBL. KRAFT PKG. IND. CONV. SPECIAL INDUSTRIAL AND OTHER	5,725	297	56	9	59	172	1
TISSUE	4,506	1,635	42	124	135	641	693
TOTAL PAPERBOARD	**31,429**	**10,241**	**1,604**	**1,344**	**6,337**	**842**	**114**
KRAFT, BL. & UNBL.	19,149	857	—	26	757	74	—
SEMICHEMICAL	4,689	1,218	14	6	1,169	29	—
RECYCLED	7,591	8,166	1,590	1,312	4,411	739	114
CONSTRUCTION PAPER AND BOARD	**3,466**	**1,794**	**939**	**322**	**436**	**93**	**4**
DISTRIBUTION		**100.0**	**17.1**	**16.0**	**44.9**	**14.8**	**7.2**

Note: 159,000 tons of waste paper for molded pulp included under construction paper and board.

WORLD CAPACITY WOODPULP

Thousands of **METRIC** Tons ■ (Except Defibrated/Exploded & Screenings)

	TOTALS			MECHANICAL		SEMICHEMICAL		CHEMICAL PAPER GRADES			
	1979	1983	Percent Increase	1979	1983	1979	1983	1979	1983	*of which market* 1979	1982*
World Total	**142,586**	**159,211**	**11.7**	32,486	37,798	10,465	11,600	93,593	103,376	24,863	27,338
Developed Mkt. Economies	**117,594**	**128,162**	**9.0**	27,347	31,819	8,856	9,523	77,440	82,867	20,993	22,319
Northern America	**69,309**	**75,853**	**9.4**	13,159	15,697	4,589	5,120	49,759	53,224	11,134	11,940
of which: U.S.	**46,788**	**51,706**	**10.5**	4,149	5,556	4,130	4,646	37,102	40,072	4,682	5,173
Canada	**22,521**	**24,147**	**7.2**	9,010	10,141	459	474	12,657	13,152	6,452	6,767
Japan	**12,856**	**13,998**	**8.9**	2,335	2,697	1,919	1,949	8,123	8,873	1,070	1,070
Western Europe	**32,203**	**34,680**	**7.7**	10,723	11,988	1,793	1,887	18,334	19,499	8,396	8,926
of which: E.E.C.	**6,655**	**7,253**	**9.0**	3,044	3,296	705	744	2,499	2,802	979	1,146
Nordic Countries	**20,695**	**22,340**	**7.9**	6,690	7,690	860	915	12,490	13,145	5,995	6,140
Rest of W.E.	**4,853**	**5,087**	**4.8**	989	1,002	228	228	3,345	3,552	1,422	1,640
Oceania	**2,186**	**2,400**	**9.8**	869	1,046	393	405	924	949	329	329
Others	**1,040**	**1,231**	**18.4**	261	391	162	162	300	322	64	54
Developing Mkt. Economies	**6,747**	**9,597**	**42.2**	990	1,441	592	802	4,935	7,073	1,869	2,567
Africa	**377**	**825**	**118.8**	27	36	10	58	340	731	283	497
Latin America	**4,994**	**6,672**	**33.6**	515	773	488	617	3,931	5,217	1,586	1,899
of which: Brazil	**2,970**	**3,940**	**32.7**	182	205	245	249	2,501	3,314	1,150	1,459
Asia	**1,376**	**2,100**	**52.6**	448	632	94	127	664	1,125	—	171
Cent. Planned Economies	**18,245**	**21,452**	**17.6**	4,149	4,538	1,017	1,275	11,218	13,436	2,001	2,452
Asia 1/	**2,601**	**3,089**	**18.8**	942	1,128	—	—	1,619	1,921	—	—
Eastern Europe	**4,269**	**5,093**	**19.3**	957	965	417	475	2,399	3,115	301	452
U.S.S.R.	**11,375**	**13,270**	**16.7**	2,250	2,445	600	800	7,200	8,400	1,700	2,000

Source: Food and Agriculture Organization of the United Nations
U.S. capacity - American Paper Institute. Canadian capacity - Canadian Pulp and Paper Association.

**No data available for 1983.*

FUTURE PLANS 1980 — 1983

END PRODUCT Thousands short tons	1980	1981	1982	1983
TOTAL ALL GRADES	**15,606**	**16,586**	**17,201**	**17,514**
TOTAL PAPER	**3,676**	**3,910**	**4,079**	**4,167**
NEWSPRINT	781	369	928	988
PRINTING, WRITING AND RELATED	866	895	911	918
UNBL. KRAFT PKG. IND. CONV. SPECIAL INDUSTRIAL AND OTHER	302	342	342	344
TISSUE	1,727	1,804	1,898	1,917
TOTAL PAPERBOARD	**10,182**	**10,856**	**11,287**	**11,512**
KRAFT, BL. & UNBL.	945	1,076	1,255	1,317
SEMICHEMICAL	1,298	1,385	1,428	1,530
RECYCLED	7,939	8,395	8,604	8,665
CONSTRUCTION PAPER AND BOARD	**1,748**	**1,820**	**1,835**	**1,835**

Note: 172,000 tons of waste paper for molded pulp included under construction paper and board each year.

Waste paper data are collected in an industry-wide survey of paper and paperboard mills. Definitions used in this survey are as follows:

1979 - Actual consumption

1980 - Consumption should be calculated on the basis of estimated production for 1980 and should reflect production cutbacks, losses due to strikes, etc.

1981 through 1983 - Consumption at capacity levels of production.

PAPER/PAPERBOARD (Except Insulating & Hard Pressed Board)

Thousands of **METRIC** Tons ■

DISSOLVING		TOTALS			NEWSPRINT		PRINTING and WRITING		WRAPPING 2/		ALL OTHER	
1979	1983	1979	1983	Percent Increase	1979	1983	1979	1983	1979	1983	1979	1983
6,042	6,437	**192,283**	**217,680**	**13.2**	27,296	33,270	45,334	53,359	88,557	97,635	31,096	33,416
3,951	3,953	**150,810**	**167,368**	**11.0**	22,806	27,467	36,708	42,722	68,814	73,500	22,482	23,679
1,802	1,812	**75,449**	**83,269**	**10.4**	12,829	15,403	16,148	18,464	36,832	39,313	9,640	10,089
1,407	1,432	**60,917**	**67,195**	**10.3**	3,809	5,153	14,567	16,679	33,542	35,968	8,999	9,395
395	380	**14,532**	**16,074**	**10.6**	9,020	10,250	1,581	1,785	3,290	3,345	641	694
479	479	**21,453**	**24,294**	**13.2**	2,707	3,296	4,405	5,794	10,544	10,878	3,797	4,326
1,353	1,306	**50,353**	**55,519**	**10.3**	6,491	7,592	15,665	17,927	19,804	21,068	8,393	8,932
407	411	**27,518**	**29,946**	**8.8**	1,870	2,131	9,515	10,587	9,930	10,726	6,203	6,502
655	590	**15,150**	**17,375**	**14.7**	3,875	4,630	3,820	4,935	6,155	6,390	1,300	1,420
291	305	**7,685**	**8,198**	**6.7**	746	831	2,330	2,405	3,719	3,952	890	1,010
–	–	**2,300**	**2,677**	**16.4**	543	725	274	300	1,323	1,473	160	179
317	356	**1,255**	**1,609**	**28.2**	236	451	216	237	311	768	492	153
230	281	**15,025**	**20,005**	**33.1**	1,372	2,309	3,626	4,849	8,375	10,792	1,652	2,055
–	–	**720**	**1,095**	**52.1**	24	93	228	329	429	626	39	47
60	65	**8,601**	**11,086**	**28.9**	707	1,275	1,688	2,156	4,965	6,063	1,241	1,591
42	42	**3,291**	**4,172**	**26.8**	147	260	747	981	1,859	2,325	538	606
170	216	**5,704**	**7,825**	**37.2**	641	941	1,710	2,364	2,981	4,103	372	417
1,861	2,203	**26,448**	**30,307**	**14.6**	3,118	3,494	5,000	5,788	11,368	13,343	6,962	7,682
40	40	**8,955**	**10,026**	**12.0**	950	1,116	2,417	2,718	27	30	5,561	6,162
496	538	**5,993**	**6,781**	**13.1**	468	478	1,133	1,420	3,801	4,233	591	650
1,325	1,625	**11,500**	**13,500**	**17.4**	1,700	1,900	1,450	1,650	7,540	9,080	810	870

1/ Includes China, Democratic People's Republic of Korea, Mongolia, Socialist Republic of Viet-Nam and Democratic Kampuchia.

2/ Includes wrapping and packaging paper and paperboard. *Totals not adjusted for rounding differences.*

CAPACITY
ANNOUNCED EXPANSIONS

Planned expansion projects listed below include new paper, paperboard and woodpulp mills and new paper and paperboard machines in existing mills. Each project has been publicly announced by the management of the company concerned and is included in the confirmed capacity estimates reported in this survey. These capacity estimates also include other expansion projects that have not been publicly announced which, in keeping with the confidential nature of the survey, are not included in this listing. The list does not include publicly announced expansion projects that are under serious consideration but not yet confirmed.

NEW MILLS & MACHINES

Thousands short tons

COMPANY	LOCATION	GRADE	APPROXIMATE ANNUAL CAPACITY
1980			
Bear Island Paper Co.	Doswell, Va.	Newsprint	180
Boise Cascade Corp.	Wallula, Wash.	Uncoated Free Sheet	140
Boise Southern Co.	De Ridder, La.	Newsprint	180
Champion International Corp.	Courtland, Ala.	Unccated Free Sheet	150
Champion International Corp.	Missoula, Mont.	Unbleached Kraft Linerboard	250
Diamond International Corp.	Middletown, Ohio	Recycled Paperboard	10 (net)
Georgia Kraft Co.	Macon, Ga.	Unbleached Kraft Linerboard	175
Midtec Paper Corp.	Kimberly, Wisc.	Coated Groundwood	125
Potlatch Corp.	Lewiston, Idaho	Tissue	50
Procter & Gamble Co.	Albany, Ga.	Tissue	*
Union Camp Corp.	Montgomery, Ala.	Unbleached Kraft Linerboard	350
1981			
Boise Cascade Corp.	Rumford, Me.	Coated Groundwood	160
Buckeye Cellulose Corp.	Oglethorpe, Ga.	Bleached Sulphate Pulp	300
Fort Howard Paper Co.	Muskogee, Okla.	Tissue	85
Georgia Pacific Corp.	Palatka, Fla.	Tissue	55
International Paper Co.	Mansfield, La.	Unbleached Kraft Linerboard	460
International Paper Co.	Mansfield, La.	Semichemical Paperboard	270
Publishers Paper Corp.	Newberg, Ore.	Newsprint	210
Scott Paper Co.	Everett, Wash.	Tissue	53
Stone Container Corp.	Florence, S.C.	Unbleached Kraft Linerboard	105
North Pacific Paper Corp.	Longview, Wash.	Newsprint	210
1982			
Madison Paper Corp.	Madison, Me.	Uncoated Groundwood	165
Mead Corp.	Chillicothe, Ohio	Uncoated Free Sheet	75 (net)
Mead Corp.	Escanaba, Mich.	Coated Groundwood	200
St. Regis Paper Co.	Pensacola, Fla.	Unbleached Kraft Paper	†
St. Regis Paper Co.	Sartell, Minn.	Coated Groundwood	168
Western Kraft Paper Group	Hawesville, Ky.	Uncoated Free Sheet	100
Weyerhaeuser Co.	Valliant, Okla.	Unbleached Kraft Linerboard	200
Weyerhaeuser Co.	Columbus, Miss.	Coated Groundwood	175
1983			
MacMillan Bloedel Inc.	Pinehill, Ala.	Semichemical Paperboard	200

* *not announced*

† *will replace existing facilities, net increase not announced*

DEFINITIONS AND GRADE DESCRIPTIONS

(Continued from inside front cover)

Recycled Paperboard: Paperboard manufactured from a combination of recycled fibers from various grades of paper stock with the predominant portion of its furnish being recycled fibers; sometimes including a very minor portion of virgin fibers.

Linerboard: Recycled paperboard produced from a furnish containing less than 80% virgin kraft woodpulp and used as facing material when combining paperboard for conversion into corrugated or solid fiber boxes.

Corrugating Medium: Recycled paperboard produced from a furnish containing less than 75% virgin woodpulp and used as the fluting material when combining paperboard for conversion into corrugated boxes.

Container Chip and Filler Board: Recycled paperboard manufactured as a filler for solid fiber board for conversion into solid fiber boxes and other container chipboard (all chipboard under 26 pounds per 1000 sq. ft. manufactured for use as facing corrugated, solid fiber and single faced products which are used for interior packing, e.g., pads, partitions, dividers, layers and cushioning).

Folding: Recycled paperboard manufactured with bending quality for conversion into folding cartons (including unlined chipboard, kraft lined, white lined and clay coated).

Set-up: Recycled paperboard manufactured with non-bending specifications for conversion into rigid or set-up boxes (including plain chipboard, newslined, white vat lined).

Gypsum Wallboard Facing: Recycled paperboard manufactured for use as liner or facing on gypsum board, plasterboard (includes white, cream, gray, blue and all colors).

Other: Recycled paperboard with the same characteristics as paperboard for bending packaging or non-bending packaging but for non-packaging uses; plus recycled paperboard for end uses not otherwise classified, such as tag, file folder, tube, can, drum, match stem, tablet backs, toys, etc.

CONSTRUCTION PAPER AND BOARD & OTHER

Construction Paper: Sheathing paper, felts (roofing felts, floor covering, automotive felts, deadening, industrial, pipe covering, refrigerator), asbestos paper and asbestos filled paper, flexible wood fiber insulation.

Wet Machine Board: Binders board, shoe board (e.g., counter board, heel board, innersole, etc.) automotive board, chair seat backing, coaster board, luggage, mill board, panel board, table top board, etc.

Insulating Board: A fibrous-felted homogeneous panel made by interfelting of the fibers (e.g., interior building board, wallboard, sound deadening board, acoustical tile, exterior sheathing board, roof insulation board, trailer board, etc.).

WOODPULP

Dissolving & Special Alpha: Highly refined bleached white sulphite or sulphate pulps with a high content of alpha (pure cellulose) fiber.

Sulphite Paper Grades: Paper grade pulps produced by the sulphite process. Bleached pulp must achieve a G.E. Brightness of more than 75.

Sulphate & Soda Paper Grades: Paper grades pulps produced by the sulphate or soda process. Bleached pulp must achieve a G.E. Brightness of more than 75. Semibleached pulp must achieve a G.E. Brightness of not less than 45 or more than 75.

Semichemical: High yield pulps produced with the use of some chemical agent such as neutral sulphite (N.S.S.C.); alkaline cook; chemipulp (defibrated pulp put through reaction chambers); chemimechanical pulp with a yield usually above 60%.

Mechanical: Pulps produced by mechanical rather than chemical processes.

(For Paper & Paperboard): Fine textured, usually bright pulps, used in paper and paperboard manufacture.

Stone Groundwood: Pulp produced by grinding wood logs or bolts (usually 4 ft. in length) into relatively short fibers.

Refiner: Pulp produced by subjecting wood chips and/or residues to atmospheric or open discharge refining.

Thermomechanical: A high-yield pulp produced by a thermomechanical process in which wood particles are softened by pre-heating under pressure prior to a pressurized primary refining stage. Usually replaces or reduces the chemical pulp component in newsprint or groundwood papers.

(For Other Paper and Board): Coarse, often brown, pulps used in the manufacture of insulating board and construction paper. Also includes similar pulps if used in the manufacture of wet machine board. Excludes pulp for hard pressed board.

Stone Groundwood and Refiner: Pulps produced by the stone groundwood or refiner processes but used in the manufacture of Other Paper and Board.

Defibrated/Exploded: Pulps produced by subjecting wood chips to preheating and pressurized refining. Similar to the thermomechanical process except that operating variables produce an economical, coarse brown pulp suitable only for Other Paper and Board.

Screenings: Rejects and off-quality screenings from all grades of woodpulp except dissolving.

FIBERS

Roundwood: Comprises roundwood bolts and logs (4 feet or longer, including tree lengths) brought to the pulpmill for chipping or chips made from primary roundwood bolts and logs at a chipmill, remote from the pulpmill.

Forest Residues: All logging residues such as portions of bolts or logs less than the minimum diameter specified by the consuming mill and poles, saplings, slash, limbs, twigs, or portions of bolts or logs not regarded as merchantable in normal pulpwood or sawlog operations. May also include merchantable portions of trees that will not be used for higher value products. Chips made from forest residues.

Manufacturing Residues: All mill residues such as slabs, edgings, trimmings, cores, planer shavings, sawdust or other wood residues of a wood manufacturing process and chips made from these residues.

Other Fibers: Cotton linters, cotton linter pulp, textile mill waste and cuttings, rags, waste rope and cordage, bagasse, flax, straw, jute, esparto, kenaf and all other non-wood fibers used in paper and paperboard manufacture.

PAPER STOCK GRADES

Mixed Papers: Number 1 and 2 mixed papers, super mixed papers, boxboard cuttings, mill wrappers.

Newspapers: Number 1 news, overissue news, super news. Any grade to be used as a news substitute.

Corrugated: Old containers both corrugated and solid fiber, container plant cuttings.

Pulp Substitutes & High Grade Deinking: Includes ledger, tabulating cards, bleached sulphate shavings (unless used as a news substitute). Envelope and bleached sulphite and sulphate cuttings, coated book stock, news and publication blanks, kraft paper and bags and all other grades not classified above.

Print free grades are reported as Pulp Substitutes and printed grades, if deinked, are reported as High Grade Deinking.